



The Purpose of the Alaskan Way Seawall

The central seawall, originally constructed between 1911 and 1936, extends along the western edge of downtown Seattle. It provides structural support to surface streets, the Alaskan Way Viaduct, buildings, and utilities. If the seawall were to fail, sections of the viaduct and adjacent structures and utilities could collapse or become unsafe, damaging Seattle's waterfront and potentially resulting in loss of life.

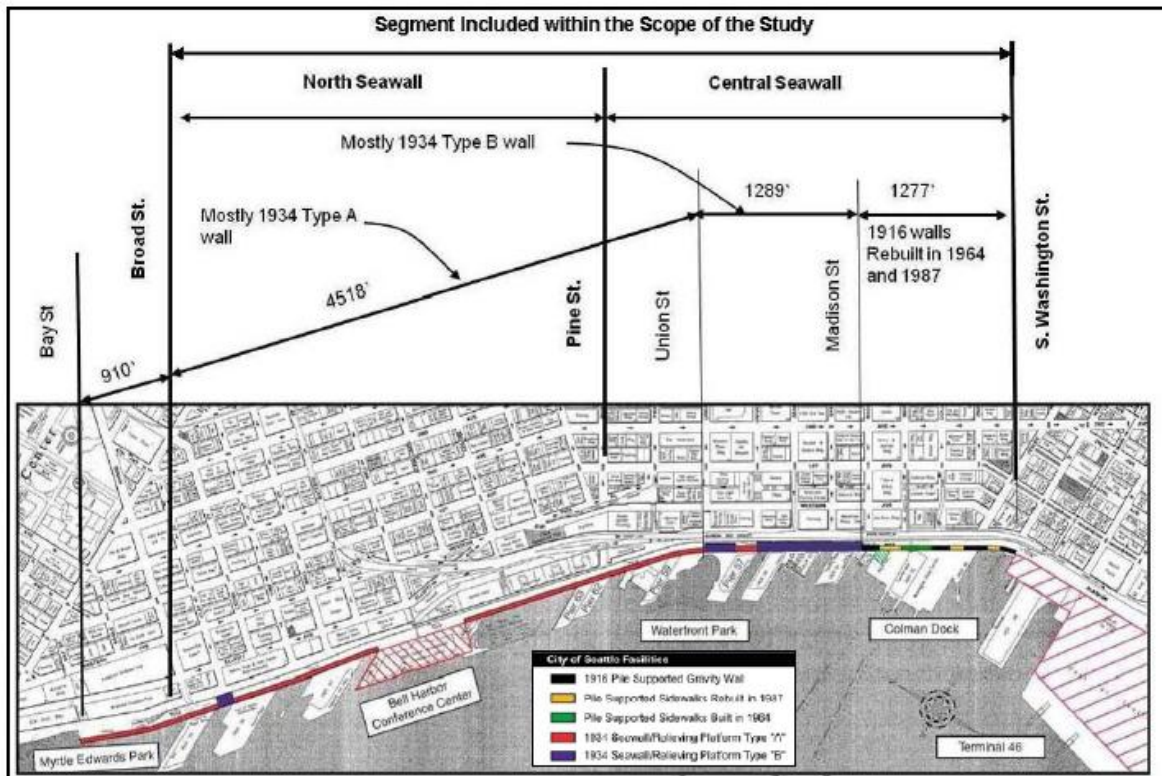


Figure 1 - Seawall Study Area

The Urgent Need to Replace the Seawall

Seattle's seawall is showing the considerable effects of its age and exposure to the corrosive marine environment. In 2002, the Seattle Department of Transportation (SDOT) discovered that 40-50 percent of the timber relieving platform that supports the seawall and street is significantly damaged because of age, the effects of tidal erosion, and subsequent harm caused by marine borers and earthquakes (see Figure 2). Results of this study also indicated that 90 percent of the structure's cap beams show some degree of deterioration and only 10 percent were fully intact.

Seawall Replacement Program

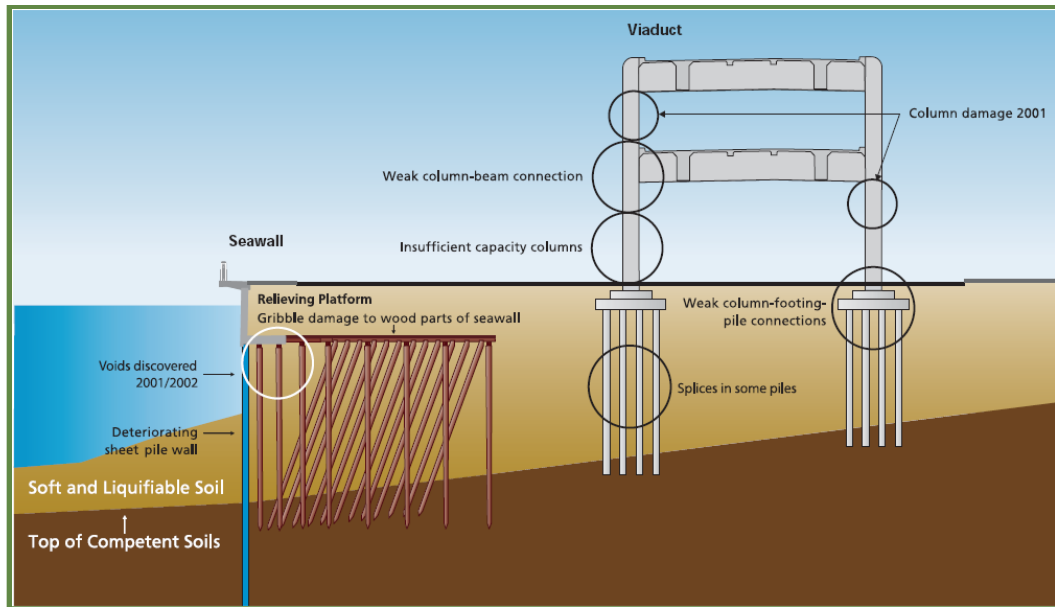


Figure 2 – Seawall and Viaduct Vulnerabilities

The major risk facing the Alaskan Way seawall is its seismic vulnerability. When the seawall was originally designed and constructed, engineers did not account for seismic events in their design so the existing seawall structure cannot resist the seismic forces associated with earthquakes of the magnitude experienced in this region.

Shortly after the 2001 Nisqually earthquake, a 100-foot-long by 10-foot-wide section of the Alaskan Way surface street settled, exposing additional problems with the seawall. Soil held back by the seawall is likely to liquefy in earthquakes, which is what occurred along this section of the waterfront during the Nisqually earthquake. When soil liquefies, it transforms from a solid material that can support roadways and other structures to a quicksand-like material that flows like a liquid. The current seawall is unable to prevent this liquefied soil from leaking out into the water, jeopardizing structures built nearby. The likelihood of another seismic event occurring in the next 10 years that could significantly damage the seawall is one in 10. A study conducted by external structural engineers revealed that another major earthquake would likely cause the seawall to fail.

All subsequent seawall investigations and inspections conducted by the city of Seattle have shown that the seawall continues to deteriorate despite regular maintenance. Marine organisms called gribbles are eating away at the timbers that support the seawall. Inspections conducted in 2005 also found new seawall damage from another marine organism called a shipworm. Shipworms have damaged approximately 55 percent of the wood panels that protect portions of the seawall. This damage means that even without an earthquake, there is a risk of localized collapses of the sidewalk and street.



Example of a Gribble



Seawall Replacement Program

SDOT actively monitors the seawall, but the deteriorated condition of the seawall over time has increased the city's required annual maintenance and repairs. Since the Nisqually earthquake, the city of Seattle has committed over \$3 million to temporary repairs of the seawall. These repairs were performed in 2002-04 and 2007, and include:

- Settlement repair to a 350 linear foot section near the Seattle Aquarium, which required the installation of compaction grouting and riprap at the toe of the wall between 2002-2004 (Total Cost = \$1.9M).
- Removal of some ekki wood facing, patching of parts of the sheet pile seawall, and installation of a new cathodic protection system at Clay Street in 2007 (Total Cost = \$1.1M).

Neither of these patch repairs have dealt with the seismic vulnerability of the seawall or addressed systemic damage to the structure. The most recent repair, at Clay Street, is to the north of the central waterfront and outside of the South Washington to Pine Street scope of the current seawall replacement project.

Design and Permitting

On November 18, 2009, SDOT requested Statements of Qualifications from consultants with experience in innovative seawall design and construction, engineering, environmental analysis and documentation, economic analysis and public involvement. Applications were received earlier this month and a consultant team will be selected and retained in February.

Design of the seawall will be coordinated with the Central Waterfront design and planning process in order to fully integrate seawall design concepts with the waterfront public space and Alaskan Way surface street design.

SDOT is looking to replace the seawall with a long-term solution that meets seismic standards, improves habitat, and provides effective protection for the public, waterfront facilities and economic activities.



Seawall Replacement Program

Mayor McGinn's Seawall Proposal

On January 14, 2010, Mayor Mike McGinn announced his intent to accelerate seawall design, permitting and construction, with the goal of completing the project in four years instead of the previously scheduled six. Extensive federal, state, and local permitting requirements complicate timely project completion, but SDOT is accelerating work under the city's control to replace the seawall as soon as possible.

As part of his announcement, Mayor McGinn also proposed a May 2010 election on a \$241 million bond to fund the project. Legislation will be transmitted to the council for consideration in February.

For More Information:

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